

Intelligent Marine Transportation Systems

PRINCIPAL INVESTIGATOR:

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PROJECT DESCRIPTION:

Maritime and intermodal transportation is the backbone of international transportation for manufactured goods. General cargo ships, sailing on regular schedules along established trade lanes, annually move over 1.2 billion metric tons of consumer, industrial, and military commodities ranging from fatigues and milling machines to perfume and designer jeans. The number of intermodal containers handled by the world's liner ports has doubled in the past ten years.

As key links in global supply chains involving higher-value, more time-sensitive cargoes, liner services are subject to increasing pressures from shippers, who in turn are driven by the ever-rising expectations of their own customers. Shippers, recognizing the benefits of inventory reduction and compressed, transparent supply chains, want better on-time performance, improved document accuracy, greater in-transit visibility, and expedited information flows

Economic realities and infrastructure constraints have driven the industry into near-obsessive pursuit of operational efficiency and improved performance. Low rates of return on investment and high capital equipment costs compel carriers to seek every opportunity to increase asset utilization, improve productivity, and reduce operating costs. Empty container repositioning and overcapacity caused by directional imbalances in cargo flows are persistent operational and financial problems.

Many ports suffer from landside congestion, insufficient water depth, and lack of land upon which to build. Movement of cargo to and from the intermodal marine terminal is frequently made difficult by urban traffic and delays around terminal gates. Competing demands for waterfront property and environmental concerns about dredging also impede or deny expansion of ports to accommodate increased cargo and larger vessels.

In short, the liner sector is a vital, but seriously challenged partner in global logistics systems. In developing strategies to deal with these issues, leading-edge carriers are turning to approaches that fall under the umbrella of Intelligent Transportation Systems, or "ITS". Put simply, ITS is the fusion of information technology and transportation management. Today, the potential for improved efficiency and asset utilization, higher service levels, tightened cargo security, augmented military capability, enhanced safety,

and stronger environmental protection lies increasingly with ITS applications.

PROGRESS TO DATE: In liner shipping, a variety of ITS applications are now being used or created to capture and communicate timely and accurate information flows concerning the location, status, and progress of vessels, vehicles, equipment, personnel, and cargo in intermodal supply chains. These include systems for navigation, collision avoidance, vessel traffic management, stowage planning, container tracking, chassis identification and location, cargo monitoring, and communications. Marine container terminals—especially their gates—have been the focus of recent ITS innovations designed to reduce paper exchanges and streamline cargo handling.

FUTURE PLANS: The next few years will be crucial to the future of intermodal ITS. A major task will be to deal with the question of system interoperability. Corporate attachment to proprietary technologies, investments in legacy systems, fragmented technological innovation, and institutional barriers to information sharing will have to be addressed if the benefits of ITS are to be realized on a global scale. Development of systems that communicate across diverse business enterprises, borders, technologies, and differing commercial and military interests will be dependent upon the active cooperation of public and private entities.

PRODUCTS: The proposed session will examine the drivers of ITS-type technology adoption in the intermodal ocean carrier segment of the MTS, evaluate the operational and commercial value added by such implementation, and survey specific and emerging technologies and concepts in this area.